

INFORMATION SHEET

ORDER NO. R5-2005-____
NPDES NO. CA0004057
FORMICA CORPORATION
SIERRA PLANT
PLACER COUNTY

BACKGROUND INFORMATION

The Formica Corporation, (Discharger) owns and operates a distribution and manufacturing facility located on the western side of the City of Rocklin in Placer County. The manufacturing facility, known as the Sierra Plant, manufactures Formica brand high-pressure decorative plastic laminate. Press cooling water and press vacuum cooling water are detained in an earthen, unlined area to provide some temperature equalization and particulate settling prior to discharge into a drainage ditch via a subsurface culvert and elevation control outlet. Print and translucent air conditioning cooling water, treater unwind brake cooling water and treater end rolls cooling water are discharged directly into the drainage ditch via a separate culvert upstream of the outlet where the press cooling waters enter the ditch. The noncontact cooling water discharges mix in the drainage ditch and a pH balance system is used to feed sulfuric acid into the effluent to lower the pH prior to it entering an unnamed tributary that joins Pleasant Grove Creek approximately two miles downstream. The discharge has resulted in the formation of a freshwater marsh at the point of discharge (hereafter emergent marsh). The Discharger has constructed an additional containment area for chemical spill prevention, which protects against discharge to surface waters in the event of any spillage of phenolic resin or isopropyl alcohol when the storage tanks for these chemicals are being filled. Any wastewater or residue that accumulates in this containment area is disposed of as hazardous waste. Alcohol, phenolic resin, and melamine resin also are stored in above-ground tanks with concrete spill catchment basins.

Process wastewater, consisting of boiler blowdown, air compressor cooling water, sheet duller rinse water, and sanitary wastewater are discharged to the Roseville Regional Wastewater Treatment Plant. It may be possible for the facility to discharge its noncontact cooling waters, permitted for discharge under this Order, to the Roseville Regional Wastewater Treatment Plant, thus eliminating the need for an NPDES permit for discharge to surface waters.

BENEFICIAL USES OF THE RECEIVING WATER

The Basin Plan does not specifically identify beneficial uses for the unnamed tributary to Pleasant Grove Creek and Pleasant Grove Creek, but does identify present and potential uses for the Sacramento River. The beneficial uses of any specifically identified water body generally apply to its tributary streams; thus, the beneficial uses identified in the Basin Plan for the Sacramento River, from the Colusa Basin Drain to the "I" Street Bridge, are applicable to Pleasant Grove Creek. Additionally, the emergent marsh contains aquatic habitat, and the unnamed tributary to Pleasant Grove Creek qualifies as waters of the state and have the same beneficial uses as Pleasant Grove Creek. These beneficial uses are municipal and domestic supply, agricultural irrigation,

water contact recreation, non-contact water recreation, warm freshwater aquatic habitat, warm fish migration habitat, and warm spawning habitat, cold freshwater aquatic habitat, cold fish migration habitat, and cold spawning habitat, wildlife habitat, and navigation. This determination is based on the following facts:

a. *Domestic Supply and Agricultural Supply*

The Regional Board is required to apply the beneficial uses of municipal and domestic supply to the Sacramento River based on State Board Resolution No. 88-63 which was incorporated in the Basin Plan pursuant to Regional Board Resolution 89-056. In addition, the SWRCB has issued water rights to existing water users along the Sacramento River, the unnamed tributary and Pleasant Grove Creek downstream of the discharge for domestic and irrigation uses. Since the unnamed tributary and Pleasant Grove Creek are ephemeral streams, they also likely provide groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in receiving stream.

b. *Water Contact and Noncontact Recreation and Esthetic Enjoyment*

The discharge flows through residential areas and there is ready public access to the unnamed tributary of Pleasant Grove Creek, Pleasant Grove Creek, Pleasant Grove Creek Canal, Natomas Cross Canal, and the Sacramento River. Exclusion of the public is unrealistic and contact recreational activities currently exist along the unnamed tributary of Pleasant Grove Creek, Pleasant Grove Creek, Pleasant Grove Creek Canal, Natomas Cross Canal, and the Sacramento River and these uses are likely to increase as the population in the area grows.

c. *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources*

The California Department of Fish and Game (DFG) has verified that the fish species present in the Sacramento River and downstream waters are consistent with both cold- and warm-water fisheries and that there is a potential for anadromous fish migration, thus necessitating a cold-water designation. The Basin Plan (Table II-1) designates, the Sacramento River as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan, the cold designation applies to the unnamed tributary of Pleasant Grove Creek, Pleasant Grove Creek, Pleasant Grove Creek Canal, Natomas Cross Canal, and the Sacramento River. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/L. This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/L, the Discharger is not required to improve the naturally occurring level. Currently the unnamed tributary of Pleasant Grove Creek and Pleasant Grove Creek are ephemeral streams. The City of Roseville

has constructed a new wastewater treatment plant that currently discharges a significant volume of effluent to Pleasant Grove Creek. The City's wastewater discharges will change the character of the receiving stream where currently there may be periods where there is not hydraulic continuity with downstream waters. The significantly increased flow rate will increase the likelihood of coldwater fish migration into the Natomas Cross Canal, Pleasant Grove Creek Canal, Pleasant Grove Creek, and the unnamed tributary to Pleasant Grove Creek. Regional Board staff has observed large numbers of fish in the emergent marsh.

DILUTION CONSIDERATIONS

The unnamed tributary to Pleasant Grove Creek and Pleasant Grove Creek, absent the discharge, are ephemeral streams. The ephemeral nature of the unnamed tributary to Pleasant Grove Creek, and Pleasant Grove Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within the unnamed tributary to Pleasant Grove Creek, and Pleasant Grove Creek help support the aquatic life. Both conditions may exist within a short time span, where the unnamed tributary to Pleasant Grove Creek, and Pleasant Grove Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Sacramento River. Dry conditions occur primarily in the summer months, but may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Dilution may occur during and immediately following high rainfall events.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All mass-based effluent limitations are calculated using the following equation:

$$X \frac{\mu g}{l} \times 10^{-6} \frac{g}{\mu g} \times 3.79 \frac{l}{gal} \times Flow \frac{gals}{day} \times 0.0022 \frac{lbs}{g} = Y \frac{lbs}{day} \quad (*)$$

where

X = Concentration-based Effluent Limitation

Y = Mass-based Effluent Limitation

Chemical Oxygen Demand

Chemical oxygen demand (COD) is the measure of the oxygen equivalent of the portion of organic matter that can be oxidized by a strong chemical oxidizing agent. Order No. 97-112 established effluent limitations for chemical oxygen demand (COD) of 10 mg/L or 83 lbs/day (monthly average) and 35 mg/L or 292 lbs/day (daily maximum), which were technology-based limits developed using best professional judgment. These limitations are equivalent to the level of effluent quality expected by domestic tertiary treatment and also will be protective of beneficial

uses of the receiving water, particularly in maintaining dissolved oxygen levels. An excess of chemical oxygen demanding substances can cause depletion of the instream dissolved oxygen levels thereby causing harm to aquatic life. To ensure attainment of beneficial uses, this Order carries over the COD Effluent Limitations established by the previous Order.

TSS

Total suspended solids (TSS) are solids in water that can be trapped by a filter. Total suspended solid is a parameter used to measure water quality as a concentration of mineral and organic sediment. TSS can include a wide variety of material, such as silt, decaying plant and animal matter, industrial wastes, and sewage. High concentrations of suspended solids can cause many problems for stream health and aquatic life.

High TSS can block light from reaching submerged vegetation. As the amount of light passing through the water is reduced, photosynthesis slows down. Reduced rates of photosynthesis cause less dissolved oxygen to be released into the water by plants. If light is completely blocked from bottom dwelling plants, the plants will stop producing oxygen and will die. As the plants are decomposed, bacteria will use up even more oxygen from the water. Low dissolved oxygen can lead to fish kills. High TSS can also cause an increase in surface water temperature, because the suspended particles absorb heat from sunlight. This can cause dissolved oxygen levels to fall even further (because warmer waters can hold less DO), and can harm aquatic life in many other ways.

Order No. 97-112 established effluent limitations for TSS of 10 mg/L or 83 lbs/day (monthly average) and 15 mg/L or 125 lbs/day (daily maximum), which were technology-based limits developed using best professional judgment. These limitations are equivalent to the level of effluent quality expected by domestic tertiary treatment and also will be protective of the narrative water quality objective for suspended material from the Basin Plan. In order to ensure attainment of beneficial uses, this Order carries over the TSS Effluent Limitations established by the previous Order.

REASONABLE POTENTIAL ANALYSIS FOR EFFLUENT LIMITATIONS – NON-CTR CONSTITUENTS

Data submitted by the Discharge in response to the 10 September 2001 letter also were used to perform the reasonable potential analysis for constituents that are not included in the CTR or NTR. The analysis determines whether the discharge may cause, have a reasonable to cause, or contribute to an exceedance of any water quality criteria or objectives based on procedures in the USEPA Technical Support Document for Water Quality-Based Toxics Control (TSD). 40 CFR 122.44 (d)(1)(iii), states: “...a discharge causes, has a reasonable potential to cause, or contribute to an in-stream excursion above allowable ambient concentration of State numeric criteria within a State water quality standard for an individual pollutant, the permit must contain effluent limits for that pollutant.”

All mass-based effluent limitations are calculated using the following equation:

$$X \frac{\mu g}{l} \times 10^{-6} \frac{g}{\mu g} \times 3.79 \frac{l}{gal} \times Flow \frac{gals}{day} \times 0.0022 \frac{lbs}{g} = Y \frac{lbs}{day} \quad (*)$$

where

X = Concentration-based Effluent Limitation

Y = Mass-based Effluent Limitation

Detected effluent concentrations of non-CTR constituents and reasonable potential multiplying factor are summarized in the table below:

Detected Concentrations and Reasonable Potential Multiplying Factor

Constituents	2/27/02	5/8/02	11/02	3/30/04	4/28/04	Reasonable Potential Multiplying Factor ¹ (99% Confidence Level and 99% Probability Basis)
Aluminum	ND ²	100 ²	ND ²	10 ³	28.3 ³	7.4 ⁴ 5.6 ⁵
Ammonia	90	ND	ND	--	--	5.6
Barium	17	ND	ND	--	--	5.6
Chloride	5800	5900	3100	--	--	5.6
Iron	140	ND	22	90	52.7	4.2
MTBE	ND	0.33	ND	--	--	5.6
Nitrate	110	460	ND	--	--	5.6
Sulfate	8700	8900	7600	--	--	5.6
Chloroform	16	ND	15	--	--	5.6
Naphthalene	4.5	ND	ND	--	--	5.6
Manganese	ND	74	ND	--	--	5.6

¹ The multiplying factors are 7.4 (for 2 samples), 5.6 (for 3 samples), and 4.2 (for 5 samples).

² Reported as total recoverable concentrations

³ Reported as acid-soluble aluminum concentrations.

⁴ Based on the two acid-soluble concentrations collected on 30 March 2004 and 28 April 2004.

⁵ Based on the three total recoverable concentrations collected on 27 February 2002, 8 May 2002, and November 2002.

Projected Maximum Effluent Concentration (MEC) of non-CTR constituents and controlling water quality criteria are summarized in the table below:

Controlling Water Quality Criteria and Projected Maximum Effluent Concentrations

Constituents	Controlling Water Quality Criteria (µg/L)	Criterion Concentration (µg/L)	Projected MEC ¹ (µg/L)	Reasonable Potential?
Aluminum	Basin Plan narrative toxicity objective and USEPA Ambient Water Quality Freshwater Aquatic Life Criteria	87	209 ² 560 ³	Yes
Ammonia	Basin Plan narrative toxicity objective and USEPA Ambient Water Quality Freshwater Aquatic Life Criteria	624	504	No
Barium	Basin Plan objective	100	95	No
Chloride	Agricultural Water Quality Goal	106,000	33,040	No
Iron	Basin Plan chemical constituent objective and Secondary MCL	300	588	Yes
MTBE	Basin Plan chemical constituent objective and Secondary MCL	5	1.8	No
Nitrate	Basin Plan chemical constituent objective and Primary MCL	10,000	2,576	No
Sulfate (as SO ₄)	Basin Plan chemical constituent objective and Secondary MCL	250,000	49,840	No
Chloroform	Basin Plan chemical constituent objective and Primary MCL	80	90	Yes
Naphthalene	Basin Plan narrative toxicity objective and U.S.EPA IRIS Reference Dose as a drinking water level	14	25	Yes
Manganese	Basin Plan chemical constituent objective and Secondary MCL	50	414	Yes

¹ The projected MEC (maximum effluent concentration) is determined by multiplying the maximum detected concentration with a reasonable potential multiplying factor that accounts for statistical variation. The multiplying factor (for 99% confidence level and 99% probability basis) is dependent on the coefficient of variation (CV) and number of reported effluent results. For less than 10 effluent data points, CV is estimated to equal 0.6.

² Calculated based on the two effluent data (measured in acid soluble concentrations)

³ Calculated based on the three effluent data (measured in total recoverable concentrations)

Aluminum

Aluminum occurs naturally and makes up about 8% of the surface of the earth. When aluminum enters the environment, it can dissolve in lakes, streams, and rivers depending on the quality of the water. Studies have shown that infants and adults who received large doses of aluminum developed bone diseases, which suggests that aluminum may cause skeletal problems. Some sensitive people develop skin rashes from using aluminum chlorohydrate deodorants.

Reported effluent concentrations for aluminum are summarized in the following table:

Sampling Dates	Reported Effluent Concentrations of Aluminum (µg/L)
2/27/02	ND ¹
5/8/02	100 ¹
11/5/02	ND ¹
3/30/04	10 ²
4/28/04	28.3 ²

¹ Reported as total recoverable concentrations

² Reported as acid-soluble concentrations

Using the methodology in the USEPA's Technical Support Document (TSD) for Water Quality-Based Toxics Control, the projected maximum effluent concentration (MEC) of aluminum is calculated at 560 µg/L (as total recoverable concentration) and 209 µg/L (as acid-soluble concentration). Aluminum exists as aluminum silicate in suspended clay particles, which U.S. EPA acknowledges might be less toxic than other forms of aluminum. Correspondence with U.S. EPA indicates that the criterion is not intended to apply to aluminum silicate. Therefore, a monitoring method that excludes aluminum silicate is likely to be more appropriate. The use of acid-soluble analysis for compliance with the aluminum criterion appears to satisfy U.S. EPA. USEPA established recommended ambient water quality criteria for the protection of freshwater aquatic life at 87 µg/L (four-day average) and 750 µg/L (one-hour average). The California DHS has established a secondary MCL for aluminum of 200 µg/L, with the USEPA having a secondary MCL of 50-200 µg/L. The projected MECs of aluminum as total recoverable and acid-soluble exceed the most stringent freshwater aquatic life criterion and the secondary MCLs established by the State and USEPA. Effluent Limitations are required for aluminum and are included in this Order based on the Basin Plan narrative toxicity objective utilizing the EPA Recommended Ambient Water Quality Criteria.

The USEPA TSD recommends converting acute (one-hour average) and chronic (four-day average) aquatic life criteria to maximum daily and average monthly effluent limitations. These conversions are calculated in the following equations:

$$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\sigma)$$

$$LTA_c = WLA_c \times \exp(0.5\sigma_4^2 - z\sigma_4)$$

$$AMEL = LTA_c \times \exp(z\sigma_n - 0.5\sigma_n^2)$$

$$MDEL = LTA_a \times \exp(z\sigma - 0.5\sigma^2)$$

where

WLA_a = Acute wasteload allocation

WLA_c = Chronic wasteload allocation

LTA_a = Acute long-term average wasteload

LTA_c = Chronic long-term average wasteload

σ = Standard deviation

CV = coefficient of variation (where $\sigma^2 = \ln(CV^2 + 1)$)

(CV = 0.6 where less than 10 data points are available)

AMEL = Average monthly effluent limitation

MDEL = Maximum daily effluent limitation

z = z-statistic for 95th percentile probability (AMEL) and 99th percentile probability (MDEL)

n = number of samples per month (minimum n = 4)

Using these equations, maximum daily and average monthly concentration-based Effluent Limitations for aluminum are calculated at 750 µg/L and 71 µg/L, based on the USEPA Ambient Water Quality criteria for protection of aquatic life. The corresponding mass-based Effluent Limitations are 6.3 lbs/day and 0.59 lbs/day.

Ammonia

In water, un-ionized ammonia (NH_3) exists in equilibrium with the ammonium ion (NH_4^+). The toxicity of aqueous ammonia solutions to aquatic organisms is primarily attributable to the un-ionized ammonia form, with the ammonium ion being relatively less toxic. Total ammonia refers to the sum of these two forms in aqueous solutions. Analytical methods are used to directly determine the total ammonia concentration, which is then used to calculate the un-ionized ammonia (toxic) concentration in water.

USEPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life, for total ammonia, include acute (1-hour average) standards based on pH and chronic (30-day average) standards based on pH and temperature. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. USEPA has presented the acute ammonia criteria in three ways: as equations, in a table, and in graphs that relate pH to ammonia concentrations. The most stringent of these criteria, based on a pH of 7.9 (the high pH of both the discharge and receiving water) and temperature of 38°C (the maximum temperature of the discharge) is the chronic criterion of 624 µg/L (as N). Ammonia was detected in the discharge at a concentration of 90 µg/L.

Sampling Dates	Reported Effluent Concentrations of Ammonia (µg/L)
2/27/02	90
5/8/02	ND

11/02*	ND
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* Exact sample date unknown, analysis date 11/15/02

Using the TSD reasonable potential analysis, the calculated MEC of ammonia in the discharge is 504 µg/L, well below the most stringent criterion for ammonia (as N); therefore, no effluent limitation is required for ammonia.

Barium

USEPA has found barium to potentially cause gastrointestinal disturbances and muscular weakness resulting from acute exposures at levels above the MCL of 1,000 µg/L. No Health Advisories have been established for short-term exposures. Barium has the potential to cause hypertension resulting from long-term exposures at levels above the MCL. There is no evidence that barium has the potential to cause cancer from lifetime exposures in drinking water.

The largest end use of barium metal is as a "getter" to remove the last traces of gases from vacuum and television picture tubes. It is also used to improve performance of lead alloy grids of acid batteries; as a component of grey and ductile irons; in the manufacture of steel, copper and other metals; as a loader for paper, soap, rubber and linoleum. Barium sulfate is also used in photographic papers, pigments and as a filler for rubber & resins.

Reported effluent concentrations for barium are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Barium (µg/L)
2/27/02	17
5/8/02	ND
11/02*	ND

* Exact sample date unknown, analysis date 11/15/02

Using the TSD reasonable potential analysis, the projected MEC of barium is 95 µg/L. The Basin Plan objective for portions of the Sacramento River is 100 µg/L. This value was cited as the criterion of concern in the 10 September 2001 letter. The projected MEC does not exceed this level; therefore, no effluent limitation is required for barium.

Chloride

Sodium chloride consists of sodium ions (Na⁺) and chloride ions (Cl⁻) held together in a crystal. In water, sodium chloride breaks apart into an aqueous solution of sodium and chloride ions. This solution will conduct an electric current. Because dissolved ions in water increase conductivity, the measures of chloride ion and EC are related. Chloride was detected in the effluent at a

maximum concentration of 5.9 mg/L. Reported effluent concentrations of chloride are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Chloride (mg/L)
2/27/02	5.8
5/8/02	5.9
11/02*	3.1

* Exact sample date unknown, analysis date 11/15/02

Using the TSD reasonable potential analysis, the projected MEC of chloride is 33 mg/L. The Agricultural Water Quality Goal for chloride is 106 mg/L. The projected MEC of chloride does not exceed the Agricultural Water Quality Goal; therefore, no effluent limitation for chloride has been established in this Order.

Iron

Iron is an abundant element in the earth's crust. It is believed to be the major component of the earth's core. Iron is rarely found uncombined in nature except in meteorites, but iron ores and minerals are abundant and widely distributed. Several studies have shown that high iron content in the body linked to cancer and heart disease. Iron can be poisonous and if high dose of iron is taken over a long period, it could result in liver and heart damage, diabetes, and skin changes.

Reported effluent concentrations of iron are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Iron (µg/L)
2/27/02	140
5/8/02	110
11/02*	22
3/30/04	90
4/28/04	52.7

* Exact sample date unknown, analysis date 11/15/02

Using the TSD reasonable potential analysis procedure, the projected MEC of iron is calculated at 588 µg/L. The California DHS and USEPA secondary MCL for iron is 300 µg/L. The projected MEC of iron exceeds the secondary MCL of 300 µg/L; therefore, there is a reasonable potential that the discharge will cause or contribute to an excursion of the Basin Plan chemical constituents objective. This Order contains a monthly average concentration-based Effluent Limitation for iron of 300 µg/L based on the Basin Plan chemical constituents objective at the Secondary MCL. The monthly average mass-based Effluent Limitation for iron is calculated at 2.5 lbs/day.

Methyl Tert-Butyl Ether (MTBE)

MTBE (methyl tert-butyl ether) is a member of a group of chemicals commonly known as fuel oxygenates. Oxygenates are added to fuel to increase its oxygen content. MTBE is used in gasoline throughout the United States to reduce carbon monoxide and ozone levels caused by auto emissions. Releases of MTBE to ground and surface water can occur through leaking underground storage tanks and pipelines, spills, emissions from marine engines into lakes and reservoirs, and to some extent from air deposition. MTBE has been used in U.S. gasoline at low levels since 1979 to replace lead as an octane enhancer (helps prevent the engine from "knocking"). Since 1992, MTBE has been used at higher concentrations in some gasoline to fulfill the oxygenate requirements set by Congress in the 1990 Clean Air Act Amendments.

Reported effluent concentrations of MTBE are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of MTBE (µg/L)
2/27/02	ND
5/8/02	0.33
11/02*	ND

* Exact sample date unknown, analysis date 11/15/02

Using the reasonable potential analysis from the TSD, the projected MEC of MTBE is 1.8 µg/L. The Department of Health Services has developed a Secondary MCL of 5 µg/L for MTBE. The projected MEC of MTBE does not exceed the Secondary MCL; therefore, no Effluent Limitation for MTBE is included in this Order.

Nitrate

Reported effluent concentrations of nitrate are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Nitrate (as N) (µg/L)
2/27/02	110
5/8/02	460
11/02*	ND

* Exact sample date unknown, analysis date 11/15/02

Using the TSD reasonable potential analysis, the projected MEC of nitrate is 2,576 µg/L. The Primary MCL for nitrate is 10,000 µg/L (as N). The projected MEC does not exceed the Primary MCL; therefore, no effluent limitation is required for nitrate.

Sulfate

Sulfate is a substance that occurs naturally in drinking water. Health concerns regarding sulfate in drinking water have been raised because of reports that diarrhea may be associated with the

ingestion of water containing high levels of sulfate. Of particular concern are groups within the general population that may be at greater risk from the laxative effects of sulfate when they experience an abrupt change from drinking water with low sulfate concentrations to drinking water with high sulfate concentrations.

Reported effluent concentrations of sulfate are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Sulfate (µg/L)
2/27/02	8700
5/8/02	8900
11/02*	7600

* Exact sample date unknown, analysis date 11/15/02

The California Secondary MCL for sulfate is 250 mg/l. The projected MEC of sulfate is 50 mg/L, which does not exceed the Secondary MCL; therefore, no effluent limitation is required for sulfate.

Chlorine

The Basin Plan states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." U.S. EPA has developed Recommended Ambient Water Quality criteria for the protection of freshwater aquatic life. USEPA's recommended acute (1-hour average) and chronic (4-day average) aquatic life criteria for chlorine are 19 µg/L and 11 µg/L respectively. Water chemistry analyses conducted in conjunction with chronic toxicity testing in 2000, 2001, and 2002 have indicated total chlorine concentrations in samples of effluent ranging from below detection to 0.3 mg/L

(300 µg/L). All but one sample exceeded both the acute and chronic criteria. The chlorine in bioassay samples has had a significant time to degrade while the sample was transported to the laboratory without measures designed to preserve chlorine. Chlorine volatilizes quickly and U.S. EPA recommends that samples be analyzed immediately with a minimal holding time. The actual effluent chlorine concentration was reasonably higher than the level detected at the off-site laboratory. The total residual chlorine discharged from the facility has the reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan narrative toxicity objective. Based on this information, this Order includes effluent limitations for total residual chlorine of 0.01 mg/L as a 4-day average and 0.02 mg/L as a 1-hour average.

Chlorine limitations shall become effective by **1 August 2005**. Additionally, all but one of the data points exceeded the effluent limitation for chlorine, which indicates the potential for continuous violation of the effluent limit. To insure compliance, continuous monitoring for chlorine shall be provided.

Naphthalene

Analytical laboratory results submitted by the Discharger indicate that naphthalene was detected in 1 of 3 effluent samples. The maximum detected effluent concentration of naphthalene was reported at 4.5 µg/l. Naphthalene is included in the CTR. However, no CTR criteria for naphthalene have yet been established. Therefore, the reasonable potential analysis for non-CTR constituents is applied to naphthalene to determine whether naphthalene causes or has a reasonable potential to cause an exceedance of a water quality criterion or objective. U.S.EPA Integrated Risk Information System (IRIS) includes a reference dose as a drinking water level of 14 µg/l for naphthalene. Using the TSD reasonable potential analysis, the projected MEC of naphthalene is calculated at 25 µg/l. The projected MEC of naphthalene exceeds the U.S. EPA IRIS reference dose. Because beneficial uses of the receiving waters include municipal and domestic supply, the discharge from the Sierra Plant has a reasonable potential to cause an exceedance of the Basin Plan narrative toxicity objective and the U.S. EPA IRIS reference dose as a drinking water level for naphthalene. To protect the municipal and domestic water supply beneficial use, this Order includes a monthly average concentration-based Effluent Limitation for naphthalene based on the Basin Plan narrative toxicity objective and the U.S.EPA IRIS reference dose.

Manganese

Analytical laboratory results submitted by the Discharger indicate that manganese was detected in 1 of 3 effluent samples. The maximum detected effluent concentration of manganese was reported at 74 µg/l. U.S. EPA and the Department of Health Service established a Secondary MCL of 50 µg/l for manganese. Using the TSD reasonable potential analysis, the projected MEC of manganese is calculated at 414 µg/l. The maximum detected effluent concentration of manganese exceeds the Secondary MCL. To protect the municipal and domestic water supply beneficial use, this Order includes a monthly average concentration-based Effluent Limitation for manganese based on the Basin Plan chemical constituents objective at the Secondary MCL of 50 µg/l.

Persistent Chlorinated Hydrocarbon Pesticides

Analytical laboratory results submitted by the Discharger indicate that 2,4-D and dalapon have been detected in the effluent. 2,4-D was detected at an estimated concentration (reported as “J Flag”) of 0.26 µg/l. The Method Detection Limit (MDL) and the Reporting Limit (RL) for 2,4-D were reported at 0.098 µg/l and 9.5 µg/l, respectively. Dalapon was detected at an estimated concentration (reported as “J Flag”) of 17 µg/l. The Method Detection Limit (MDL) and the Reporting Limit (RL) for dalapon were reported at 4.3 µg/l and 190 µg/l, respectively.

The Basin Plan includes a water quality objective for pesticides on page III-6.0, which states: “*No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses*” and that “*Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer*”. California DHS established a Primary MCL of 70 µg/l and 200 µg/l for 2,4-D and dalapon, respectively. For the purposes of this Order, the list of persistent chlorinated hydrocarbon pesticides will include but not be limited to the following:

Aldrin	Endosulfan I (Alpha)
Alpha BHC	Endosulfan II (Beta)
Beta BHC	Endosulfan Sulfate
Gamma BHC (Lindane)	Endrin
Delta BHC	Endrin Aldehyde
Captan	Heptachlor
Chlordane	Heptachlor Epoxide
2,4-D	Isodrin (an isomer of Aldrin)
2,4-DB	Kepone (Chlordecone)
2,4-D compounds	MCPA
DDD (TDE)	MCPP
DDE	Methoxychlor
DDT	Mirex
Dalapon	PCNB
Dicamba	Pentachlorophenol
Dichloran	Perthane
Dichloroprop	Strobane
Dicofol	2,4,5-T
Dieldrin	2,4,5,TP (Silvex)
Dinoseb	2,4,5-T compounds
	Toxaphene

The Basin Plan objective is more restrictive than the drinking water quality standards for persistent chlorinated hydrocarbon pesticides. Therefore, the Basin Plan objective shall be used to establish effluent limitation. The presence of 2,4-D and dalapon in the effluent indicates that the discharge from the Sierra Plant has a reasonable potential to cause or contribute to an exceedance of Basin Plan objectives for persistent chlorinated hydrocarbon pesticides. This Order includes an Effluent Limitation for persistent chlorinated hydrocarbon pesticides based on the Basin Plan objective.

Total Trihalomethanes and Chloroform

Chloroform was detected in two of the three effluent samples at a maximum concentration of 16 µg/l. Chloroform is included in the CTR. However, no CTR criteria for chloroform have yet been established. Therefore, the reasonable potential analysis for non-CTR constituents is applied to chloroform to determine whether chloroform causes or has a reasonable potential to cause an exceedance of a water quality criterion or objective. Using the TSD reasonable potential analysis, the projected MEC of chloroform is calculated at 90 µg/l.

The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within Cal/EPA. The OEHHA cancer potency value for oral exposure to chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard

toxicologic assumptions used by OEHHA and U.S. EPA in evaluating health risks via drinking water exposure of 70 kg body weight and 2 liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 µg/L (ppb) at the one-in-a-million cancer risk level. This risk level is consistent with that used by the DHS to set *de minimus* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by U.S.EPA in applying human health protective criteria contained in the NTR and the CTR to priority toxic pollutants in California surface waters. Since no drinking water intakes are likely to exist where the ingestion of water is equivalent to the level used in development of the cancer risk assessment downstream of the discharge from the Sierra Plant; therefore, setting a chloroform effluent limitation based on a cancer risk analysis is not appropriate. Although application of the cancer risk criteria is inappropriate, protection of the municipal water supply is necessary and appropriate. The Primary MCL for total trihalomethanes, the sum of bromoform, bromodichloromethane, chloroform, and dibromochloromethane, is 80 µg/l. The projected MEC of chloroform exceeds the Primary MCL. It indicates that the discharge from the Sierra Plant does have a reasonable potential to cause an in-stream excursion above the water quality objective for municipal uses. Therefore, an Effluent Limitation for total trihalomethanes is included in this Order and is based on the Basin Plan objective for municipal use. If U.S. EPA or the State Board develops a water quality objective for chloroform and/or total trihalomethanes, this Order may be reopened and a new Effluent Limitation established.

pH

In accordance with Basin Plan requirements, the previous Order established a discharge pH range of not less than 6.5 or greater than 8.5. Effluent monitoring data from 1998-2002 demonstrate that the pH of the discharge has ranged from 6.0 to 8.5 standard pH units with a high value of 8.5 (March 2002) and one value lower than the lower limit of 6.0 (5.95 in October 2002). The facility process water is discharged into an unnamed tributary to Pleasant Grove Creek and has resulted in the formation of a freshwater marsh at the point of discharge. At times, the discharge is the only flow in the unnamed tributary to Pleasant Grove Creek and Pleasant Grove Creek. The emergent marsh contains aquatic habitat, and the unnamed tributary qualifies as waters of the United States. To insure that the discharge from this facility is not a detriment to the aquatic life in the emergent marsh, influent into the emergent marsh shall not have a pH less than 6.5 or greater than 8.5.

Toxicity

The Basin Plan states that “*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances....The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge....*” The Basin Plan requires that “*as a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.*” This Order requires both acute and chronic toxicity monitoring to evaluate compliance

with this water quality objective. The Basin Plan also states: “...*effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate*;...” Effluent limitations for acute toxicity are included in this Order.

The results of chronic whole effluent toxicity testing from three samples collected in November 2000, December 2001, and November 2002 and submitted to the Regional Board by the Discharger indicate the potential for adverse effects at various effluent concentrations.

For the November 2000 sample, *Selanastrum capricornutum* growth was adversely affected at the 12.5% concentration of effluent when compared to control water from Pleasant Grove Creek. Statistically significant effects on *Pimephales promelas* growth were observed at the 100% effluent concentration vs. creek water.

For the December 2001 sample, a statistically significant effect on *Selanastrum capricornutum* growth was observed at the 50% concentration of effluent when compared to the creek water. Statistically significant effects on *Pimephales promelas* growth were observed at the 75% effluent concentration vs. creek water.

For the November 2002 sample, statistically significant effects on *Ceriodaphnia dubia* reproduction were observed at the 100% effluent concentration when compared to the creek water. *Selanastrum capricornutum* growth was adversely affected at the 75% concentration of effluent when compared to the creek water.

With a low available dilution, it appears that discharges from the facility may cause adverse effects on aquatic organisms. Accordingly, this Order increases the frequency of chronic toxicity monitoring to quarterly. If a trend of toxicity is observed, the Discharger shall be required to develop and conduct a toxicity identification evaluation (TIE) and toxicity reduction evaluation (TRE) plan that includes a schedule for plan implementation.

Temperature

There was high variation in the effluent temperature range during the permit term (48° to 100° F), which potentially could have adverse effects aquatic life in the emergent marsh and the unnamed tributary. These effluent temperature values were measured at the point of discharge into the emergent marsh. The emergent marsh has the capability to dissipate heat, but water temperatures have not been measured at the southern point of the emergent marsh. Warm water fish species, specifically bass and blue gill, have been identified at this point. An aquatic organism survey and assessment of the emergent marsh, the unnamed tributary to Pleasant Grove Creek, or downstream waters has not been conducted to determine the presence of warm and cold-water species. The unnamed tributary to Pleasant Grove Creek and Pleasant Grove Creek currently are ephemeral streams. The discharge from the City of Roseville’s new Pleasant Grove Creek Wastewater Treatment Plant discharge into Pleasant Grove Creek will change the character of the receiving stream and increase the likelihood of cold-water fish migration. Similar Creeks in the area, such as Dry Creek and Auburn Ravine, are known to support cold-water fish species. Consultation with the California DFG regarding the presence or absence of cold-water fish species in Pleasant

Grove Creek has been unproductive to date. NPDES permits for the nearby City of Roseville's Dry Creek Wastewater Treatment Plant and for the City of Lincoln Wastewater Treatment Plant have site specific temperature limitations to protect cold-water fish species of 60° F (daily average), 62° F (daily maximum) and 58° F (monthly average), 64° F (any time from 1 October through 31 May), respectively.

The receiving stream at the point of discharge is the headwaters for the unnamed tributary to Pleasant Grove Creek. An upstream sampling point is not available to determine the thermal impacts of the discharge. The discharge flows through open areas, prior to entering downstream waters, and the thermal impacts from any discharges entering the drainage course could mask actual impacts of the discharge on downstream waters. The thermal impacts of the discharge have already been assessed and the proposal to eliminate the discharge is largely based on resolving the elevated temperature issues.

REASONABLE POTENTIAL ANALYSIS FOR EFFLUENT LIMITATIONS – CTR CONSTITUENTS

The U.S. Environmental Protection Agency (USEPA) adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. On 2 March 2000, the SWRCB adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP), which contains guidance on implementation of the NTR and CTR.

On 10 September 2001, the Executive Officer issued a letter, pursuant to California Water Code, Section 13267, requiring the Discharger to prepare a technical report assessing effluent and receiving water quality. This letter required sampling for NTR, CTR, and additional constituents to determine the water quality impacts of the discharge. The Discharger provided receiving water and effluent monitoring data for three quarters in 2002 (February, May and November). Section 1.3 of the SIP requires that the Regional Board impose water quality-based effluent limitations for a priority pollutant if (1) the maximum effluent concentration (MEC) is greater than the most stringent CTR criterion or applicable site-specific Basin Plan objective, or (2) the ambient background concentration is greater than the CTR criterion or applicable site-specific Basin Plan objective, or (3) other information is available to determine that a water quality-based effluent limitation is necessary to protect beneficial uses. The SIP also provides procedures for calculating water quality-based effluent limitations. Where effluent limitations are required, mass-based effluent limitations are calculated from concentration-based effluent limitations using the following equation:

$$X \frac{\mu g}{l} \times 10^{-6} \frac{g}{\mu g} \times 3.79 \frac{l}{gal} \times Flow \frac{gals}{day} \times 0.0022 \frac{lbs}{g} = Y \frac{lbs}{day} \quad (*)$$

where

X = Concentration-based Effluent Limitation
 Y = Mass-based Effluent Limitation

Dichlorobromomethane

Dichlorobromomethane is a colorless, nonflammable liquid. Most dichlorobromomethane is formed as a by-product when chlorine is added to wastewater to kill bacteria. The California Department of Health Services (DHS) has determined that dichlorobromomethane is reasonably anticipated to be a human carcinogen.

Data provided by the Discharger in response to the 10 September 2001 letter indicate that dichlorobromomethane was detected in the facility's effluent at a maximum concentration of 1.2 µg/L in February 2002. Reported effluent concentrations of dichlorobromomethane are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Dichlorobromomethane (µg/L)	Reported Receiving Water Concentrations of Dichlorobromomethane (µg/L)
2/27/02	1.2	ND
5/8/02	ND	1.1
11/02*	1.1	ND

* Exact sample date unknown, analysis date 11/15/02

U.S. EPA human health CTR criteria for dichlorobromomethane are 0.56 µg/l (for waters from which both water and aquatic organisms are consumed) and 46 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average. Detected concentrations of dichlorobromomethane exceed the CTR criterion for waters from which both water and aquatic organisms are consumed. Based on this information, dichlorobromomethane is discharged from the facility at levels that cause, have the reasonable potential to cause, or contribute to an excursion of applicable water quality standards. Accordingly, Effluent Limitations for dichlorobromomethane are included in this Order.

The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP states that an average monthly effluent limitation (AMEL) established for protection of human health be set equal to the effluent concentration allowance for human health protection (ECA_{hh}). In the case of a discharge with no dilution allowance, the ECA equals the CTR human health criterion. The SIP also includes the following equation for calculating the maximum daily effluent limitation (MDEL) (with the multiplier provided in the SIP) when the applicable criteria are for the protection of human health:

$$MDEL_{hh} = ECA * \left(\frac{MDEL}{AMEL} \right)_{multiplier}$$

where

ECA_{hh} = Effluent concentration allowance for the protection of human health
AMEL = Average monthly effluent limitation (for the protection of human health) = ECA_{hh}
MDEL = Maximum daily effluent limitation (for the protection of human health)

Based on the SIP requirements and using the equations above, the average monthly Effluent Limitations are 0.56 µg/L and 0.0047 lbs/day and the maximum daily Effluent Limitations for dichlorobromomethane are 1.1 µg/L and 0.0092 lbs/day. A time schedule has been included in this Order for compliance with the dichlorobromomethane limitation.

Bis(2-ethylhexyl)phthalate

Bis(2-ethylhexyl)phthalate is a colorless oily liquid that is extensively used as a plasticizer in a wide variety of industrial, domestic, and medical products. It is an environmental contaminant and has been detected in groundwater, surface water, drinking water, air, soil, plants, fish, and animals.

Bis(2-ethylhexyl)phthalate is in polyvinyl chloride plastic products like toys, vinyl upholstery, shower curtains, adhesives, and coatings. Bis(2-ethylhexyl)phthalate is also used in inks, pesticides, cosmetics, and vacuum pump oil. Bis(2-ethylhexyl)phthalate is insoluble in water, miscible with mineral oil and hexane, and soluble in most organic solvents. It is easily dissolved in body fluids such as saliva and plasma. Bis(2-ethylhexyl)phthalate is a combustible liquid; it may burn, but does not readily ignite. It produces poisonous gas in a fire. When heated to decomposition, it emits acrid smoke.

The California DHS has determined that bis(2-ethylhexyl)phthalate may reasonably be anticipated to be a carcinogen. Repeated exposure to bis(2-ethylhexyl)phthalate may affect the kidneys and liver, and may cause numbness and tingling in the arms and legs.

The existing Waste Discharge Requirements, Order No. 97-112, did not include effluent limitations for bis(2-ethylhexyl)phthalate; however, it did require that the Discharger complete a study of the effects of bis(2-ethylhexyl)phthalate on surface waters. A time schedule for compliance with this Provision was included in this Order. The Discharger submitted a report in August 1998 indicating that bis(2-ethylhexyl)phthalate was detected in several samples during a one-month sample period. Additional sampling was conducted and a second report was submitted in May 1999. This report indicated that bis(2-ethylhexyl)phthalate was not detected in any of the samples at the lowest practicable detection limits. The Regional Board did not reopen the NPDES Order at that time to include effluent limits for bis(2-ethylhexyl)phthalate; however, the Board did recommend that the Discharger continue periodic sampling and analysis to determine and eliminate the source. In the *May 1999 Final Water Quality Sampling Report: Bis(2-ethylhexyl)phthalate*, the Discharger indicated that the source of the contamination had been identified and that bis(2-ethylhexyl)phthalate was no longer present in the discharge. Data provided by the Discharger in response to the 10 September 2001 letter indicate that bis(2-ethylhexyl)phthalate was detected at a maximum effluent concentration of 9.0 µg/L (November

2002). Reported effluent concentrations of bis(2-ethylhexyl)phthalate are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Bis(2-ethylhexyl)phthalate (µg/L)	Reported Receiving Water Concentrations of Bis(2-ethylhexyl)phthalate (µg/L)
2/27/02	ND	ND
5/8/02	ND	ND
11/02*	9.0	3.0

* Exact sample date unknown, analysis date 11/15/02

U.S. EPA human health NTR criteria for bis(2-ethylhexyl)phthalate are 1.8 µg/l (for waters from which both water and aquatic organisms are consumed) and 5.9 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average. The maximum detected concentration of bis(2-ethylhexyl)phthalate exceeds human health NTR criteria. The presence of bis(2-ethylhexyl)phthalate in an effluent sample collected in 2002 indicates that the source of bis(2-ethylhexyl)phthalate has not yet been eliminated and that bis(2-ethylhexyl)phthalate is discharged from the facility at levels that cause, have the reasonable potential to cause, or contribute to an excursion of applicable water quality standards. Accordingly, Effluent Limitations for bis(2-ethylhexyl)phthalate are included in this Order.

The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP states that an average monthly effluent limitation (AMEL) established for protection of human health be set equal to the effluent concentration allowance for human health protection (ECA_{hh}). In the case of a discharge with no dilution allowance, the ECA equals the CTR human health criterion. The SIP also includes the following equation for calculating the maximum daily effluent limitation (MDEL) (with the multiplier provided in the SIP) when the applicable criteria are for the protection of human health:

$$MDEL_{hh} = ECA * \left(\frac{MDEL}{AMEL} \right)_{multiplier}$$

where

ECA_{hh} = Effluent concentration allowance for the protection of human health
 AMEL = Average monthly effluent limitation (for the protection of human health) = ECA_{hh}
 MDEL = Maximum daily effluent limitation (for the protection of human health)

Based on the SIP requirements and using the equations above, the average monthly Effluent Limitations for bis(2-ethylhexyl)phthalate are 1.8 µg/L and 0.015 lbs/day and the maximum daily Effluent Limitations for bis(2-ethylhexyl)phthalate are 3.6 µg/L and 0.03 lbs/day. A time schedule has been included in this Order for compliance with the bis(2-ethylhexyl)phthalate limitation.

Chromium (III)

Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. Total chromium measures the combined levels of trivalent chromium (chromium III) and hexavalent chromium (chromium VI). Chromium (III) occurs naturally in the environment and is an essential nutrient. Chromium (VI) is generally produced by industrial processes, such as chrome plating, dyes and pigments, leather tanning, and wood preserving. There is evidence to suggest that chromium (VI) may be converted to chromium (III) in the human body; particularly in the acidic environment of the digestive system. In addition, chromium (III) is the most stable form. Therefore, total chromium in the effluent is likely to be in the chromium (III) form. Based on these considerations, water quality standards for chromium (III) are used to evaluate whether detected concentrations of chromium in the discharge from the facility cause or contribute to an exceedance of a water quality standard.

Data submitted by the Discharger provides monitoring results for chromium (total) and chromium (VI). Estimated concentrations of chromium (III) are calculated by subtracting the difference of chromium (VI) concentration from the chromium (total) concentration, however there were no detected concentrations of chromium (VI) in the effluent, therefore no calculations were necessary.

USEPA developed hardness-dependent freshwater aquatic life CTR criteria for chromium and recommended factors to convert dissolved concentrations to total recoverable concentrations. The dissolved concentration is divided by the conversion factor to convert it to a total recoverable concentration. Conversion factors for chromium (III) in freshwater are 0.316 and 0.860 for acute and chronic criteria, respectively. The criterion continuous concentration (four-day average) and the criterion maximum concentration (one-hour average) for chromium are calculated as total recoverable concentrations based on a receiving water hardness of 140 mg/L (as CaCO₃). This hardness value is the minimum observed hardness of the receiving water from the data provided by the Discharger in response to the Regional Board's 10 September 2001 letter.

$$CCC = e\{0.819[\ln(hardness)] + 1.561\} \quad CMC = e\{0.819[\ln(hardness)] + 3.688\}$$

where

CCC = criteria continuous concentration (four-day average)

CMC = criteria maximum concentration (one-hour average)

A comparison of detected concentrations and the applicable criteria is presented as follows:

Sampling Dates	Detected Concentrations of Chromium (III) (µg/L) (Total Recoverable)	Reported Receiving Water Concentrations of Chromium (III) (µg/L) (Total Recoverable)	CCC (µg/L)	CMC (µg/L)
2/27/02	0.56	1.4	272.7	2287.5

5/8/02	1.9	1.4	272.7	2287.5
11/02	1.2	1.2	272.7	2287.5

* Exact sample date unknown, analysis date 11/15/02

Detected concentrations of chromium (III) do not exceed freshwater aquatic life CTR criteria. Therefore, no Effluent Limitation for chromium (III) is included in this Order.

Copper

Data submitted by the Discharger indicate that copper was detected in each of three effluent samples as summarized in the table below. USEPA developed hardness-dependent freshwater aquatic life CTR criteria and included these criteria in the CTR. The CTR criteria for copper are presented as dissolved concentrations. USEPA also recommended factors to convert dissolved concentrations to total recoverable concentrations. The conversion factor for copper in fresh water is 0.960 for both acute and chronic criteria. The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for copper below were calculated in total recoverable concentrations based on a hardness of 140 mg/L (as CaCO₃) of the receiving water.

$$CCC = e^{\{0.8545[\ln(hardness)]-1.702\}}$$

$$CMC = e^{\{0.9422[\ln(hardness)]-1.700\}}$$

where

CCC = criteria continuous concentration (four-day average)

CMC = criteria maximum concentration (one-hour average)

A comparison of detected concentrations and the applicable criteria is presented as follows:

Sampling Dates	Reported Effluent Concentrations of Copper (µg/L) (Total Recoverable)	Reported Receiving Water Concentrations of Copper (µg/L) (Total Recoverable)	CCC (µg/L) (Total Recoverable)	CMC (µg/L) (Total recoverable)
2/27/02	2.9	1.6	12.4	19.2
5/8/02	3	1.6	12.4	19.2
11/02*	1.8	2.0	12.4	19.2

* Exact sample date unknown, analysis date 11/15/02

In addition to these criteria, the USEPA human health CTR criterion is 1,300 µg/L (for the consumption of water and aquatic organisms).

The maximum detected concentration of copper does not exceed the CTR criteria. Therefore, no Effluent Limitation for copper is included in this Order.

Lead

Data submitted by the Discharger indicate that lead was detected once in the effluent at a concentration of 0.093 µg/L and once in the receiving water at a concentration of 0.42 µg/L. USEPA developed hardness-dependent freshwater aquatic life CTR criteria for lead and recommended conversion factors (CF) to convert between dissolved concentrations and total recoverable concentrations. The conversion factors, based on the hardness, for chronic and acute condition in freshwater are calculated using the following equations:

$$CF_C = (1.46203 - \{\ln(\text{hardness})\} \times 0.145712)$$

$$CF_A = (1.46203 - \{\ln(\text{hardness})\} \times 0.145712)$$

where

CF_C = conversion factor for chronic criteria

CF_A = conversion factor for acute criteria

The criterion continuous concentration (four-day average) and the criterion maximum concentration (one-hour average) for lead as total recoverable concentrations are 4.88 µg/L and 125.3 µg/L and were determined based on a hardness of 140 mg/L (as CaCO₃) of the receiving water using the following equations:

$$CCC = e^{\{1.273[\ln(\text{hardness})] - 4.705\}}$$

$$CMC = e^{\{1.273[\ln(\text{hardness})] - 1.460\}}$$

where

CCC = criteria continuous concentration (four-day average)

CMC = criteria maximum concentration (one-hour average)

A comparison of detected concentrations and the applicable criteria is presented as follows:

Sampling Dates	Reported Effluent Concentrations of Lead (µg/L) (Total Recoverable)	Reported Receiving Water Concentrations of Lead (µg/L) (Total Recoverable)	CCC (µg/L) (Total Recoverable)	CMC (µg/L) (Total recoverable)
2/27/02	ND	ND	4.88	125.3
5/8/02	ND	ND	4.88	125.3
11/02*	0.093	0.42	4.88	125.3

* Exact sample date unknown, analysis date 11/15/02

All detected concentrations of lead are below all CTR criteria. Therefore, no Effluent Limitation for lead is included in this Order.

Mercury

Mercury is a neurotoxin, meaning it affects the nervous system. The three most common forms of mercury are elemental, inorganic, and methylmercury. Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or “salts,” which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common form of mercury is methylmercury. Mainly microscopic organisms in the water and soil produce methylmercury. More mercury in the environment can increase the amounts of methylmercury that these small organisms make. The three forms of mercury can all produce adverse health effects at sufficiently high doses. USEPA has determined that mercuric chloride and methylmercury are possible human carcinogens. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation. USEPA has determined that eating mercury-contaminated fish is the primary route of exposure to mercury for most people.

Mercury was detected in both the effluent and receiving water samples taken by the Discharger. Reported effluent and receiving water concentrations for mercury are summarized in the following table:

Sampling Dates	Reported Effluent Concentrations of Mercury (µg/L)	Reported Receiving Water Concentrations of Mercury (µg/L)
2/27/02	0.0044	0.0014
5/8/02	ND	0.0019
11/02*	0.0015	0.0039

* Exact sample date unknown, analysis date 11/15/02

Human health CTR criteria for mercury are 0.05 µg/l (for waters from which both water and aquatic organisms are consumed) and 0.051 µg/ (for waters from which only aquatic organisms are consumed) as a 30-day average. In 40 CFR Part 131, USEPA acknowledges that this human health criterion may not be protective of some aquatic or endangered species. In the CTR, USEPA reserved the mercury criteria for freshwater aquatic life protection and may adopt new criteria at a later date.

Detected effluent concentrations of mercury reported by the Discharger do not exceed CTR criteria. Therefore, no Effluent Limitation for mercury is included in this Order.

Methylene Chloride

Methylene chloride is a colorless liquid with a mild, sweet odor. Another name for it is dichloromethane. Methylene chloride does not occur naturally in the environment. Methylene chloride is used as an industrial solvent and as a paint stripper. It may also be found in some aerosol and pesticide products and is used in the manufacture of photographic film.

Data submitted by the Discharger indicate that methylene chloride was detected in the effluent at a maximum concentration of 2.4 µg/L. Reported effluent and receiving water concentrations for methylene chloride are summarized in the table below:

Sampling Dates	Reported Effluent Concentrations of Methylene Chloride (µg/L)	Reported Receiving Water Concentrations of Methylene Chloride (µg/L)
2/27/02	2.4	0.88
5/8/02	0.33	ND
11/02*	ND	0.29

* Exact sample date unknown, analysis date 11/15/02

Human health CTR criteria for methylene chloride are 4.7 µg/l (for waters from which both water and aquatic organisms are consumed) and 1,600 µg/ (for waters from which only aquatic organisms are consumed) as a 30-day average. All detected concentrations of methylene chloride are below the human health CTR criteria. Therefore, no effluent limitation for methylene chloride is included in this Order.

Nickel

Data submitted by the Discharger indicate that nickel was detected in one of three effluent samples and in all three receiving water samples. USEPA developed hardness-dependent CTR criteria for the protection of freshwater aquatic life and recommended factors to convert dissolved concentrations to total recoverable concentrations. The conversion factors for nickel in freshwater are 0.998 and 0.997 for acute and chronic criteria, respectively. The criterion continuous

concentration (four-day average) and the criterion maximum concentration (one-hour average) for nickel in total recoverable concentrations are 69.3 µg/L and 623.7 µg/L, respectively, based on a hardness of 140 mg/L (as CaCO₃) of the receiving water, and calculated using the following equations:

$$CCC = e^{\{0.846[\ln(hardness)] + 0.0584\}}$$

$$CMC = e^{\{0.846[\ln(hardness)] + 2.255\}}$$

where

CCC = criterion continuous concentration (four-day average)
 CMC = criterion maximum concentration (one-hour average)

A comparison of detected concentrations and the applicable criteria for nickel is presented as follows:

Sampling Dates	Reported Effluent Concentrations of Nickel (µg/L) (Total Recoverable)	Reported Receiving Water Concentrations of Nickel (µg/L) (Total Recoverable)	CCC (µg/L) (Total Recoverable)	CMC (µg/L) (Total recoverable)
2/27/02	0.77	1.6	69.3	623.7
5/8/02	ND	2.0	69.3	623.7
11/02*	ND	2.3	69.3	623.7

* Exact sample date unknown, analysis date 11/15/02

In addition to these criteria, the USEPA human health CTR criteria for nickel are 610 µg/L (for waters that are sources of drinking water and from which aquatic organisms may be consumed) and 4,600 µg/L (for waters from which only aquatic organisms are consumed) as a 30-day average.

Detected concentrations of nickel do not exceed CTR criteria; therefore, no effluent limitation for nickel is included in this Order.

Selenium

Exposure to high doses of selenium can be toxic. The most frequently reported symptoms of selenosis (chronic selenium toxicity) are hair and nail brittleness and loss. Other symptoms may include gastrointestinal disturbances, skin rashes, a garlic breath odor, fatigue, irritability, and nervous system abnormalities.

Data submitted by the Discharger indicate that selenium was detected in one of three effluent samples and two of three receiving water samples. Reported effluent and receiving water concentrations for selenium are summarized in the following table:

Sampling Dates	Reported Effluent Concentrations of Selenium (µg/L)	Reported Receiving Water Concentrations of Selenium (µg/L)
2/27/02	0.83	1.1
5/8/02	ND	ND
11/02*	ND	1.3

* Exact sample date unknown, analysis date 11/15/02

USEPA established freshwater aquatic life CTR criteria for selenium. The criterion continuous concentration (four-day average) and maximum concentration (one-hour average) for selenium are 5.0 µg/l and 20 µg/l, respectively.

The maximum detected concentration of selenium does not exceed freshwater aquatic life CTR criteria. Therefore, no Effluent Limitation for selenium is included in this Order.

Interim Effluent Limitations for CTR Constituents

Section 2.1 of the SIP provides that: *“Based on an existing discharger’s request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.”* Section 2.1 further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: *...“(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.”* In this Order, final water quality based effluent limitations for dichlorobromomethane and bis(2-ethylhexyl)phthalate become effective on **1 June 2007** if the Discharger fails to eliminate the discharge as is proposed in the Report of Waste Discharge, or on **29 April 2010**, if regulatory requirements or unexpected equipment issues require maintenance of the discharge beyond 1 June 2007. In the event the discharge is not eliminated by 1 June 2007, the Discharger shall be required to submit a workplan that proposes additional measures that will address potential impacts of the discharge and, once approved, will have to implement that workplan promptly thereafter.

EFFLUENT LIMITATIONS REMOVED FROM ORDER

Phenols

Phenolic compounds are a group of chlorinated and nonchlorinated compounds that include a phenolic component. Order No. 97-112 included technology-based Effluent Limitations for phenols calculated based upon best professional judgment. These limits are 0.60 mg/L and 5 lbs/day (30-day average) and 3.4 mg/L and 28.4 lbs/day (daily maximum). Order No. 97-112 does not provide the basis for the effluent limitations for phenols. Since the issuance of Order 97-112, the CTR was implemented. U.S. EPA human health CTR criteria for phenol are 21 mg/l (for waters from which both water and aquatic organisms are consumed) and 4,600 mg/l (for waters from which only aquatic organisms are consumed) as a 30-day average. There are additional CTR criteria for other phenolic compounds. CTR monitoring in 2002 indicate no detectable levels of any of the CTR phenolic compounds in the effluent or at the upstream receiving water monitoring station (i.e., background). The CTR provides new information on phenols and the effects they have on human and aquatic health. Based upon the CTR criteria for phenols and phenolic compounds, there is no reasonable potential for the discharge to exceed these limitations;

therefore, Effluent Limitations for phenols have been removed from this Order. This change is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l)(12) and 122.62(a)(16).

Electrical Conductivity (or Specific Conductance)

Electrical conductivity (EC) measures the ability of the water sample to carry an electrical current, a property which is proportional to the concentration of ions in solution. Domestic and industrial uses of water, result in an increase in the mineral content of the wastewater. The salinity of the wastewater is determined by measuring the EC. When salts dissolve in water, ions are formed and the solution will conduct electricity. The EC increases with salinity because of the increasing presence of ions (usually sodium and chlorine ions).

Order No. 97-112 contained Effluent Limitations of 500 µmhos/cm (30-day average) and 1,000 µmhos/cm (daily maximum) for EC. However, the California Department of Health Services (DHS) secondary MCL for EC is 900 µmhos/cm and the agricultural water quality goal is 700 µmhos/cm. The maximum EC of effluent sampled over the previous permit term was 422.7 µmhos/cm and the average specific EC was 66.8 µmhos/cm. These values are below the secondary MCL and the agricultural water quality goal. They also are well below the effluent limitations from the previous Order. Therefore, no Effluent Limitation for EC is included in this Order. New information regarding the low EC of the effluent, based on more than five years monitoring (daily in most months), along with information regarding appropriate discharge levels for protection of agricultural and municipal beneficial uses justify removal of this effluent limitation. This change is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l)(12) and 122.62(a)(16).

COOLING WATER CHEMICAL ADDITIVES

Formica, Inc. currently discharges non-contact cooling water to the surface water. Two chemical additives, CHEMTREAT CL-1467 and CHEMTREAT CL-450 (corrosion inhibitors, biocides or anti-scaling agents), are used in the cooling water. These chemicals were present during the characterization of the discharge. The addition of chemicals to the wastestream, or cooling water, would constitute a change in the character of the wastestream and would require submittal of a Report of Waste Discharge with possible modification of this Order.

RECEIVING WATER LIMITATIONS AND MONITORING

Dissolved Oxygen

Potential cold freshwater aquatic habitat is designated as a beneficial use of the Sacramento River between the Colusa Basin Drain and the "I" Street Bridge in Sacramento. For water bodies designated as having cold freshwater aquatic habitat as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen in the Sacramento River. The current permit includes a limitation of 5.0 mg/L for dissolved oxygen. In order to assure attainment of the Basin Plan requirement for the protection of the cold freshwater

aquatic habitat beneficial use, this Order contains a new receiving water limitation of 7.0 mg/L for dissolved oxygen applied at SN001.

For surface water bodies outside of the Delta, the Basin Plan requires that “...*the monthly median of the mean daily DO concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.*” This objective is included as a receiving water limitation in the Order.

pH

Order No. 97-112 required that the 30-day average ambient pH of the receiving water should not fall below 6.5 or exceed 8.5, or change by more than 0.5 units. For all surface water bodies in the Sacramento River and San Joaquin River basins, the Basin Plan includes a water quality objective for pH in surface waters, which states: “*The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh water with designated COLD and WARM beneficial uses.*”

Temperature

The Basin Plan includes the following objective: “*At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.*” Order No. 97-112 contained a receiving water limitation that required the 30-day ambient water temperature not increase by more than 5°F. The receiving stream at the point of discharge is the headwaters for the unnamed tributary to Pleasant Grove Creek. An upstream sampling point is not available to determine the thermal impacts of the discharge. The discharge flows through open areas, prior to entering downstream waters, and the thermal impacts from any discharges entering the drainage course could mask actual impacts of the discharge on downstream waters. The thermal impacts of the discharge have already been assessed and the proposal to eliminate the discharge is largely based on resolving the elevated temperature issues.

Turbidity

The Basin Plan states that: “*Waters shall be free of changes in turbidity that cause nuisance or adversely effect beneficial uses.*” Based on Basin Plan objectives, this Order requires that increases in turbidity attributable to controllable water quality factors not exceed the following:

- 1 Nephelometric Turbidity Unit (NTU) where natural turbidity is between 0 and 5 NTUs
- 20 percent where natural turbidity is between 5 and 10 NTUs
- 10 NTUs where natural turbidity is between 50 and 100 NTUs
- 10 percent where natural turbidity is greater than 100 NTUs

This Order includes receiving water limitations for turbidity based on the water quality objective described in the Basin Plan.

pH, Temperature, and Turbidity Monitoring Requirements

This permit contains Receiving Water Limitations as required to comply with the Basin Plan’s water quality objectives. The limitations for temperature, turbidity, and pH require that the

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discharge not cause the receiving water to change by specified amounts as required in the
Receiving Water Limitations section of this Order.
